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ABSTRACT

The extent and effects of inequities in Chapter 1 compensatory funding and the relationships between demographic, financial, and educational variables and state and local Chapter 1 policies are investigated. Multiple regression analysis is used to determine the relationships among dependent variables, which include expenditures and number of participants, and independent variables, which include poverty rate, district size, urbanicity, district revenues per enrolled student, educational need, and educational cost factors. Data sources include the federal Chapter 1 database, national Census Bureau information, and New York and Vermont Department of Education records. Findings indicate that characteristics of Chapter 1 programs can be predicted by certain district financial and demographic information, such as poverty, size, and federal Chapter 1 allocations. However, the finding that high poverty districts tend to implement smaller, more expensive programs argues for the consideration of economies of scale and cost factors. Lack of federal funds prevents poor districts from exercising choice and size of programs. A recommendation is made for the acquisition of alternative funding or the alteration of federal and state distribution requirements. Nine statistical tables are included. (17 references) (LMI)

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Equity in School District Finances and Chapter 1 Programs

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Background

Education has traditionally been seen as a function of state and local governments, since it is not mentioned in the U.S. Constitution. For this reason, federal concern with education has been limited to national priorities, such as scientific training and desegregation. In the early 1960s, the economic and social effects of poverty in many areas of the country began to be of federal concern. President Kennedy first proposed federal aid to education as a means of combatting poverty; after his assassination, Lyndon Johnson added substantially to the original proposal. Johnson's goal, based on his own experiences, was to eradicate poverty via greater educational opportunities for poor children, which would lead to increased opportunities for employment. Title I of the Elementary and Secondary Education Act [ESEA] of 1965 (now Chapter 1 of the Educational Improvement and Consolidation Act [ECIA] of 1981) was the centerpiece of legislation designed to accomplish these goals. The major target of this legislation was to be "the impact of poverty and deprivation upon youngsters in the low-standard school districts of the country and in rural and urban slums" (Senator Wayne Morse, as quoted in Bailey and Mosher, p. 27).

Initial plans were to send unrestricted funds directly to state or local educational agencies with high poverty rates. These ideas were met by skepticism as to whether the money would be equitably distributed. "Do you mean you want to give the money to George Wallace?" was one comment (Kirst, as quoted by Savage, pg. 582). Congressional sentiment, however, was that specific prescriptions of educational programs would be intrusive and preempt the authority of local school boards.

The multi-tiered distributional system of Title I was developed as a compromise to direct aid at those deemed to be neediest while preserving local control over the daily operation of the schools. In this system, federal officials would allot money to counties using a formula incorporating the number of low-income children and a cost factor, and would then send the money to state educational agencies. State officials were then given a choice as to whether to use the federal formula or a different method in calculating allocations to districts which did not match county lines. Upon receiving the money from their state, local officials were then free to distribute services to schools and students using educational criteria with minimal economic guidelines.

Congress then enacted the bill, with the stated purpose:

> In recognition of the special educational needs of children of low-income families and the impact that concentrations of low-income families have on the ability of local educational agencies to support adequate educational programs...To provide financial assistance...to local educational agencies serving areas with concentrations of children from low income families to expand and improve their educational programs by various means which contribute particularly to meeting the special educational needs of educationally deprived children. (Title I, ESEA, Section 101)

Reformers thought that additional money would directly improve educational programs, and hence attainment. Therefore, the amount of money appropriated was substantial--$1.4 billion dollars in 1966. Unfortunately, the results of evaluations have been equivocal all through the program's history. As it became apparent that simply giving school districts more money did not automatically raise achievement or employment rates, regulations were changed as Title I was amended and rewritten six times. This was possible since there was never any agreement on whether the program's focus was economic need or specific educational goals. As one Congressional staff assistant commented:

> "There was never a coherent perception of what Title I was on the Hill. Perkins saw it as general aid; Robert Kennedy saw it as project-oriented..." (McLaughlin, pg. 167).

This confusion persists today in the funding and operation of Chapter 1 programs. Chapter 1 programs deal exclusively with compensatory education for underachieving students.

The amount of money provided amounts to a marginal sum for most school districts, and for some, the program's regulations require expenditures in excess of allocations. Program operations often are apparently at odds with the stated intent of Title I: Over 90% of all school districts now receive Chapter 1 aid, including many non-poor ones. The majority of students receiving Chapter 1 services are not poor. However, 13% of all elementary schools with the highest poverty rates do not receive any Chapter 1 or other compensatory funding at all, despite federal policy allowing high-poverty schools and districts to extend services to the entire student body.

The reasons for this situation and its effects have not been extensively studied. Students in areas of similar poverty in different districts or states do not necessarily receive similar Chapter 1 benefits, but the extent of these inequities is uncertain. As well, the relationship of these inequities to educational attainment or economic need has not been documented. How district demographic, financial, and educational characteristics are related to state and local Chapter 1 policies has not been studied previously.

Specific questions to be addressed by this study include the following:

1. How fair and equitable is the distribution of funding? For example, what kinds of districts receive more money? Do districts with higher educational need or higher costs receive more money?
2. Do programs differ between different types of districts, e.g. high- and low-poverty, large and small, high- and low-achieving?

Methodology

Dependent Variables:

Programs were characterized by expenditures and number of participants. The number of participants was measured by dividing the number of participants by the number of enrolled students to determine the proportion of the total school population served by Chapter 1. This proportion will be referred to as the participation rate.

The number of participants was also divided by the number of low-income students for whom money was allocated to measure how closely the Chapter 1 program reflected its poverty base. This ratio will be called the participants-poverty ratio. Expenditures were measured per participant.

Program characteristics such as setting, amount of time spent, subject matter, etc., often vary within districts, as many districts run several different types of programs. Meaningful measurement was therefore precluded, so these characteristics were omitted from the study.

Measures of educational progress of Chapter 1 students were unavailable, and so program effectiveness could not be used.

Independent variables:

District demographic, financial, and educational factors tested for associations with the dependent variables included the following:

1. Poverty rate. Since different measures were used by the federal survey and different states, see below for specific information.
2. District size, which was measured in several ways: by enrollment, number of schools, and school enrollment, where available. Although these measures are very highly correlated, they may have different effects on Chapter 1 programs. As mentioned in Chapter 2, studies have found that Chapter 1 programs are often separately administered in different schools within a district. Often, not all schools have programs, or different schools serve a different percentage of their enrollments. The number of schools in a district or school size may therefore be a more powerful predictor than overall enrollment, and so these were tested separately.
3. Urbanicity. Districts were classified as urban, rural, or suburban, but classification criteria differed slightly between federal and state sources. See below for more specific information.
4. District revenues per enrolled student, including:
    a. Total per pupil expenditures;
    b. Revenues from local sources;
        i. Tax information, where available;

ii. Information about local equivalent compensatory education programs, where they exist;

c. Revenues from state sources, including:

i. General state aid; and

ii. State funds for an equivalent compensatory education program, if one exists in that state.

d. Revenues from federal sources:

i. Chapter 1 appropriations, as measured per low-income student. Appropriations were not measured per enrolled student because they are directly dependent on poverty rate by federal formula.

ii. Other federal aid.

5. Educational need, as measured by district-wide achievement scores, where available.
6. Educational cost factors, as measured by:
   a. Student-teacher ratios; and
   b. Number of teachers.

Interactions between these variables were also tested for significance.

Data Analysis:

All analyses were done by SPSS. Districts with incomplete data on certain variables were excluded from analyses using those variables.

Means were measured for each variable. Correlations between all variables were also measured. Multiple stepwise regressions then tested the effects of combined sets of independent variables, eliminating those found not to meet significance criteria.

Dummy variables were used in regressions for the dichotomous variables: presence of a state program and presence of a local program. Urbanicity was expressed as two dummy variables, one signalling an urban district, and the other signalling a rural district.

The natural logs of all numerical variables were used in the regressions to adjust for non-linearities in the distributions of values, i.e. the difference of $100 has greater effects for districts with expenditures of $200 and $300 than those spending $1500 and $1600.

Since "rural and urban slums" (Senator Wayne Morse, op. cit.) were the original targets of Title I, separate subsets of very poor, urban, and rural districts were also analyzed to determine if funding in those districts works differently than in others. Separate subsets dividing districts by size, allocation level, presence of state and local programs, and achievement were also compared via least significant differences tests on subgroup means.

Data Sources

School district demographic, financial, and Chapter 1 information was drawn from different federal and state sources, as described in the following sections.

National Data

School district demographic, financial, and Chapter 1 information was drawn from the federal Chapter 1 District Survey. This database consists of a nationally representative sample of 2200 districts, and contains demographic and financial information about each from the school year 1984-85.[1] District poverty rates, number of schools and teachers, and urbanicity measures on the database were drawn from Census Bureau information; the remaining data were collected via surveys phoned or mailed to Chapter 1 officers in the selected districts.

Dependent variables:

Dependent variables used were those listed above. However, no direct count of the number of low-income children is in this database, so this number was derived by multiplying

the poverty rate by the enrollment in the district.

Independent variables measured in this database included:
1. District poverty rates, as measured by the U.S. Census Bureau using the Orshansky measure of poverty[2].
2. District size, as measured by enrollment, number of schools, and school size. (See above for rationale.)
3. Urbanicity, as measured by the Census Bureau by matching school districts with standard metropolitan statistical areas [SMSAs][3].
4. District revenues, including:
   a. Total per pupil expenditure.
   b. Chapter 1 expenditures per low-income student. Most districts do not carry over much money from year to year, so expenditures are nearly equal to allocations.[4] As above, the number of low-income students was estimated by multiplying the poverty rate by enrollment.
   c. Presence of an equivalent state-funded program, and the amount of money provided per enrolled student.
   d. Presence of an equivalent locally-funded program. The amount of funding for local programs was not measured.
5. The number of teachers and student-teacher ratios, used as measures of educational cost.

Results:

Combined Factors

Separate stepwise regressions for each dependent variable using all the independent variables selected the same five independent variables, including: poverty rate, expenditures per low-income student, number of schools, amount of state compensatory funds, and presence of a local program. These will be discussed separately below. Multiple correlations were quite high, as seen in Table 1. Independent variables not selected as significant included:
1. District size, as measured by enrollment or school size. The number of schools showed higher significance levels, probably because of the separate school-level administration of school Chapter 1 programs, as mentioned previously.
2. Urbanicity, despite the significant correlations with the dependent variables demonstrated in simple regressions. Presumably, urbanicity is embedded in the continuously-measured factors of poverty rate and number of schools, which measured the variance more precisely than the categorical scale of urbanicity. This will be discussed more thoroughly below.
3. Total per pupil expenditures, again despite significant correlations seen in Table 2. Specific funding for Chapter 1 and equivalent programs are obviously more salient to determining program characteristics.
4. The number of teachers and student-teacher ratios, probably because these measures were not specific to the Chapter 1 program.
5. Interactions between independent variables, while sometimes significant, did not improve on the multiple correlations observed with the five factors listed above.

Values on the dependent variables of participation rate and participant-poverty ratio were very highly predictable from the five independent variables selected, especially poverty rate and expenditures (allocations) per low-income student. Participation rate had a high positive correlation with poverty rate and expenditures per low-income student; in other words, higher poverty and higher allocations per low-income student were associated with higher participation rates and higher expenditures per participant. However, poverty showed a negative correlation with the participant-poverty ratio, meaning that high-poverty districts served fewer compared to the number of low-income students.

Expenditures per participant were more difficult to predict. Financial factors were less highly correlated with this dependent variable, so factors unavailable on this database may be more important in determining program expense. These might include educational need or decisions such as whether to use teachers or aides, pull-out or in-class programs, number of

subjects offered, and level of effectiveness attempted. These factors, where available, will be tested using state databases.

Further information on independent variables found to be significant follows.

Independent Variable: Poverty Rate

Table 4 contrasts very low poverty districts (poverty rates 7% or less) with those of very high poverty (20% or more).

Dependent variable: Participation rate

Initial analyses of the relationship between participation and poverty indicated that proportionally more students in high-poverty districts participated in Chapter 1 than in other districts, as shown by Table 3. A high correlation was found between poverty rate and participation rate. (See Table 2.) However, Table 3 shows that participation rates lag behind poverty rates when poverty is high. The average poverty rate of the high-poverty group was 29% higher than that of the low-poverty group, but participation was only 9% more.

Multiple regression, controlling other independent variables, showed a strong relationship between these two variables, with a partial correlation of .73. (See Table 1.) If district A had a poverty rate five times that of district B, A would be expected to have a participation rate triple that of B.

This lag between poverty and participation is puzzling, particularly since the federal government encourages high-poverty districts to set up school-wide programs, which would presumably raise the participation rate in poor districts.

Some possible reasons could be suggested. Referring back to Table 3, the most obvious difference between high- and low-poverty districts was in Chapter 1 expenditures (and therefore allocations) per low-income student. Chapter 1 funding per low-income student was over three times larger in low-poverty districts. Low-poverty districts received much more money per needy child than high-poverty ones, due to the incorporation of state average per pupil expenditures into the federal formula as a crude measure of cost. The tendency for low-poverty districts to be located in high-spending states, and high-poverty districts in low-spending states, assures that many high-poverty districts will receive substantially lower sums. Some of this additional money is genuinely needed for higher costs. For example, in the high-spending states of New York and California, teacher salaries, building maintenance, etc., are indeed higher than in the low-spending Southern states, which contain many high-poverty districts. However, a threefold difference in costs seems unlikely.

The greater propensity for low-poverty districts to receive "save-harmless" funding in excess of normal allocations in their states also raises allocations in these districts. Therefore, the overall higher funding for low-poverty districts may leave high-poverty districts with insufficient money to establish programs equivalent to those in districts of lower poverty rates.

The lesser likelihood of high-poverty districts to have a locally-funded compensatory education program could also be a factor here. High-poverty districts have less total revenue per enrolled student. They therefore may lack the local funds used to augment Chapter 1 programs in wealthier districts.

Although high-poverty districts are more likely to be in states with a state compensatory education program than wealthier districts, they receive less for these programs. Thus, as shown by Table 4, both types receive the same average amount of money from state programs, eliminating this as a factor.

Dependent variable: Participant-poverty Ratio

The participant-poverty ratio further illustrates the failure of participation to keep up with increased poverty. A moderately high negative correlation was observed. (See Table 2.) The ratio was over three times higher in low-poverty than high-poverty districts (see Table 3), indicating that low-poverty districts can better serve their needs, if educational and economic need indeed parallel each other. Regression revealed that if district A had five times the

poverty rate of district B, B's participant-poverty ratio would be approximately 60% that of A's. (See Table 1.)

Dependent variable: Chapter 1 Expenditure per Participant

High poverty districts spent more per participant, though not significantly so. See Table 3. Controlling other factors would leave A with a 60% increase in expenditures per participant.

There are several possible reasons for this trend. Higher expenditures may reflect higher costs of service. Higher costs are often observed in high-poverty districts because they tend to be urban or rural in greater proportion than wealthier districts. (See Table 3.) Urban districts, particularly in very large cities, generally pay more for salaries, maintenance, construction, etc. Small rural districts often suffer inefficiencies associated with small scale; for example, hiring one teacher for several schools may mean paying a large amount for travel time and expenses. Therefore, many urban and rural districts must spend more for programs equivalent to those in the suburbs.

Another possibility is that students in high-poverty districts require more expensive programs to bring them up to grade level. Since average achievement in high-poverty districts is usually lower than in wealthier ones, Chapter 1 students in high-poverty districts presumably have lower achievement than those in other districts, making remediation more difficult.

Alternatively, the higher federal sums per participant seen in poor districts may be merely a reflection of the lack of local funds to add to Chapter 1 money. More federal money must be used for fewer students, because less other money is available.

Analyses of more detailed information from selected states is expected to shed more light on these alternatives.

Independent Variable: District Size

Table 3 compares very small (enrollment of 1500 or less) with very large districts (10,000 or more).

Dependent variable: Participation Rate

Very small districts served significantly more of their students in Chapter 1 than the slightly poorer group of very large districts. This finding was contrary to the strong relationship of poverty to participation mentioned in the previous section. If district A has twice as many schools as B, A's participation rate would be expected to be 3% lower than B's.

Similar to the trends seen in the previous section, districts with higher participation rates spent (and received) substantially more Chapter 1 funds per low-income student and more total revenues, as well. Again, the incorporation of the state average per pupil expenditure may play a role here. Small districts in the sample tended to be located in higher-spending states such as New York and California. Large districts tended to be located in southern states, which have lower state average per pupil expenditures. It is questionable whether spending is higher in small districts because of higher costs due to inefficiencies associated with small scale, higher cost of living, or because more money is available through local tax revenues, state aid policies, or "save-harmless" status. This question will be addressed by the analyses done in states where tax revenue information was available.

In addition, small districts spent and received more Chapter 1 funds per enrolled student, again, despite slightly lower poverty rates.

Large districts received more local and state compensatory education money, but these additional funds were generally insufficient to bring total compensatory funding up to the level of small districts. Therefore, large districts may have lacked sufficient money to serve the same numbers of pupils as the small districts.

Dependent variable: Participant-poverty Ratio

This ratio further illustrates the difference between large and small districts. Small districts showed significantly higher ratios than large ones. Regressions showed that here district A would be expected to have a ratio 96-97% that of district B's.

If educational need parallels poverty, then small districts are meeting this need much more thoroughly. As discussed under participation rate, the greater amount of money available to small districts may be the reason for this difference.

Dependent variable: Chapter 1 Expenditures per Participant

Despite the higher amount of funds available to small districts, they spent less per participant, though the difference was not significant. (See Table 3.) These figures parallel the lower numbers of students served. Regressions revealed that district A would have expenditures per participant 3% lower than B.

This trend may exist because very large districts tend to be located in large metropolitan areas, where expenses are often high, as discussed above.

Independent Variable: Urbanicity

Table 3 also shows profiles of urban, rural, and suburban districts.

In many ways, urban and rural districts resemble each other: poverty rates and Chapter 1 program characteristics are similar, and differ from those of suburban districts. However, urban and suburban districts are significantly more likely to have local and state compensatory education programs, and receive more state compensatory money than rural districts. Suburban districts spent the most money per enrolled student, and also the most Chapter 1 money per low-income student. Rural districts spent the least. This indicates that not only do suburban districts have more funds available overall; they also receive higher allocation amounts. This may be because they are located in higher spending states, or perhaps they are more likely to receive save-harmless funds in excess of the normal allocations within their states.

Dependent variable: Participation Rate

Urban and rural districts, despite vastly different sizes and differing amounts of funds, show identical poverty and participation rates. Urban districts were far more likely to receive state and local compensatory education funds. They had higher total revenues per enrolled pupil, and more Chapter 1 funds per low-income and enrolled student.

Suburban districts had lower poverty and participation rates, despite higher total and Chapter 1 funding levels. Suburban districts fell in between urban and rural districts in the likelihood of state and local compensatory funding.

Regression using only the two dummy urbanicity variables revealed similar participation rates for urban and rural districts and a much lower rate for suburban districts. No urbanicity variables were significant in multiple regression, as mentioned previously.

Dependent variable: Participant-poverty Ratio

Urban districts served a slightly greater number of participants, compared to the number of low-income students, than rural districts. Suburban districts served still more, following their lower poverty rates.

Regressions revealed that suburban districts served more children than those counted as low-income, urban ones slightly less, and rural districts the least.

Dependent variable: Chapter 1 Expenditures per Participant

Table 3 and regressions (Table 1) showed that suburban districts spent significantly less per Chapter 1 participant than urban or rural districts. Urban districts spent more than rural ones, although not significantly more.

This may have occurred because, as mentioned above, urban and rural districts often face higher costs than suburban ones. Also, the wealthier suburban districts have more local funds, which they may use to partially fund compensatory education projects. Thus, less federal money is spent on Chapter 1 participants.

Independent Variable: Chapter 1 Expenditures per Low-Income Student

Table 3 compares districts of different allocation levels. As discussed under methods, expenditures were nearly equal to allocations, and therefore findings apply to allocations as well.

Dependent variable: Participation Rate

Simple regression and correlation found almost no association between expenditures per low-income pupil and participation rate, as seen in Table 2. However, multiple regression found a strong relationship when other independent variables were controlled. As shown in Table 1, the partial correlation rose to .57. In other words, if district A had expenditures per low-income student double those of district B, A would be expected to have a 50% higher participation rate.

Dependent variable: Participant-Poverty Ratio

A correlation of .66 was seen between Chapter 1 funding per low-income student and this ratio. With all other factors controlled, A's ratio would be expected to be 50% higher than B's.

Dependent variable: Chapter 1 Expenditures per Participant

A weaker correlation was seen between Chapter 1 expenditures per low-income student and expenditures per participant, as seen in Table 2. Multiple regression found a strong relationship, with a partial correlation of .44, controlling other factors. Here, A's expenditures would be expected to be 33% higher than B's.

These results confirmed the hypothesis that higher allocations per low-income students were associated with higher participation and higher spending.

The following independent variables had much weaker, but still significant associations with the dependent variables.

Independent Variable: State Compensatory Education Funds

Table 3 contrasts districts by the presence of a state compensatory education program.

Dependent variable: Participation Rate

The amount of state compensatory education funds showed a low positive correlation (see Table 2). Regressions showed that if district A had twice the state compensatory funding of B, A's participation rate would be expected to be 1-2% higher.

Dependent variable: Participant-Poverty Ratio

State funding had a weak positive correlation with the ratio. Here, district A's expected ratio would be 2-4% higher than B's.

Dependent variable: Chapter 1 Expenditures per Participant

There was almost no correlation between state funding and expenditures per participant. Controlling other factors, a weak negative relationship was found: district A would have 1-2% less money expended per participant.

These results confirmed that higher levels of state compensatory education funding were weakly associated with higher participation and lower Chapter 1 expenditures per participant. As discussed previously, state programs may augment federal ones, leading to lower federal expenditures per participant and increased participation.

Independent Variable: Presence of a Local Compensatory Program

Table 3 compares districts with and without local programs. A weak relationship between the dependent variables and the presence of a local program existed.

Dependent variable: Participation Rate
Controlling other factors, programs with a local program had participation rates 11% lower than those with none.

Dependent variable: Participant-Poverty Ratio
This ratio was also 11% lower for districts with no local program.

Dependent variable: Chapter 1 Expenditures per Participant
Expenditures per participant were 11% lower if there was no local program.

Presence of a local compensatory program was associated with lower participation and higher Chapter 1 spending per participant. Local programs mostly serve urban districts, which also follow these trends.

New York State Data

Data were collected on a stratified sample of 161 of the 732 school districts in New York State from the state Education Department records for the school years 1985-86 and 1986-87. Districts were chosen to reflect a range in child poverty rates. Eight districts had incomplete data due to mergers or smallness of programs, and were dropped. Although New York City showed characteristics typical of other districts with the same poverty rate (30%), it was analyzed separately so as not to unduly influence the analyses due to its large enrollment. This left 153 districts in the analysis. To minimize year-to-year variations, data were averaged across the two years.

New York has a large equivalent program, Pupils with Special Educational Needs [PSEN]. Although separate audit trails exist for Chapter 1 and PSEN, funds are often merged at the building level. PSEN funds add up to about two-thirds as much as Chapter 1 funds, and are used to augment Chapter 1 programs; for example, PSEN funds will serve students from wealthier attendance areas or will be used to add subjects to the compensatory program, such as math or writing. Therefore, Chapter 1 and PSEN programs were analyzed separately and together.

Dependent variables were calculated for Chapter 1, PSEN, and both programs combined.

Independent variables included the following:

1. Poverty rate for school-aged children, according to U.S. Census Bureau information.
2. District size, as measured by public school enrollment. Private school enrollment figures were not available, and so were not used.
3. Urbanicity, according to New York State Education Department classifications based on population density. Of the 153 school districts used, 92 are rural, 22 are urban, and 39 are suburban.
4. District finances, including:
    a. Total revenue received per enrolled pupil;
    b. Local revenue per enrolled pupil;
    c. Equalized tax base per enrolled pupil;
    d. School tax rate;
    e. State aid per enrolled pupil;
    f. PSEN aid per enrolled pupil;
    g. Chapter 1 allocations received per low-income child;

5. Achievement, as measured by the percentage of pupils passing the state Pupil Educational Progress [PEP] test scores for reading and math, given to grades 3 and 6, and writing, given in grade 5. These figures were then weighted for the number of pupils taking the exams and averaged across the two years. These scores were used because elementary schools contain most compensatory education programs, and similar standardized information was not available for the upper grades.

Results

Analysis of the New York sample generated similar findings to the national database. Correlations and regression coefficients can be found in Tables 4 and 5. District characteristics are listed in Table 6.

Generally, predictability was higher in this dataset, probably because of the smaller numbers and more precise independent variables used. The strongest associations with the dependent variables were found with the independent variables of poverty rate and program appropriation levels. Weaker associations with Chapter 1 dependent variables were found with enrollment, reading achievement, and low population density (rural district marker). PSEN dependent variables showed some associations with tax base and amounts of state aid. Combining the programs led to the combination of variables noted with each program.

Achievement data showed a strong link between poverty and achievement, but far from a perfect correlation. Participation rate also showed a high correlation with achievement (-.47), but lower than expected, given the educational criteria for selecting students on a local level. (See Table 4.) Links to the participant-poverty ratio and amount of money spent per participant were very weak, contrary to expectations that low achievement would be associated with more intense, expensive programs.

Vermont Data

As in New York, data were gathered from the records of the state Education Department. All data were from the school year 1987-88. School districts in Vermont are organized somewhat differently than in New York; often, one high school will serve several elementary districts. For taxes and other administrative functions, elementary and high school districts are combined into supervisory union districts. Since the closest equivalent to New York districts is the combined supervisory union, data were analyzed by supervisory union. All 60 supervisory unions in the state were included in the analysis.

As only one district in the state could be considered urban, and all others were primarily rural in character, districts were not analyzed by urbanicity.

Vermont has no state compensatory program equivalent to Chapter 1, and no state-wide testing program, so variables dependent on these data were not used.

Dependent variables used as specified in the methodology section.

Independent variables used included:

1. Poverty rate for school-aged children, calculated by the U.S. Census Bureau.
2. District size, measured by public school enrollment.
3. District finances, including:
    a. Total per pupil expenditures exclusive of Chapter 1 funds;
    b. Local revenue per enrolled pupil;
    c. Equalized tax base per enrolled pupil;
    d. School tax rate per enrolled pupil;
    e. State aid per enrolled pupil;
    f. Chapter 1 allocations per low-income child;

Results:

See Tables 7 and 8 for regression coefficients and correlations. Participation rate was highly predictable from poverty rate and enrollment; however, the other dependent variables showed low predictability from the factors used. The low multiple correlations observed may have been due to the small number of districts, which made significance more difficult to attain. As well, the independent variable of Chapter 1 appropriations per low-income student showed almost no variation, and thus it was eliminated.

Simple correlations and subgroup values, although not attaining the significance levels seen in the national and New York samples, did show similar values and associations as in the other datasets, as seen in Tables 8 and 9.

Conclusions:

It is true that characteristics of Chapter 1 programs can be predicted with a high degree of accuracy by certain district financial and demographic information, namely poverty, size, and federal Chapter 1 allocations. Total compensatory education programs are also highly associated with state funding received. Overall district finances and educational achievement are only weakly related to program characteristics. Data from New York State indicate that educational need and poverty rate, though strongly related (Pearson correlation -.38), are not colinear. It seems likely, therefore, that participation and expenditures are largely dictated by financial concerns rather than educational needs.

Although most local compensatory education [CE] officials claim that program size depends on the educational need of individual students, a different impression is given by these results. The relationships noted above do not necessarily determine causality; however, their presence indicates that local decisions may be influenced by the factors selected, and that similar districts tend to operate in similar ways.

The most important finding is that high poverty districts usually run smaller, more expensive programs, relative to the number of low-income students. Several reasons might enter into this scenario. Districts of higher poverty rates have higher participation rates, but participation lags behind poverty and hits a ceiling at about 25%. This tendency to resist broad-based programs may be due to insufficient funds in high poverty districts to accomplish any meaningful goal. Districts with lower poverty have more local funds to add to Chapter 1 funds; thus they have more choice as to the size and scope of these programs. As well, high-poverty districts tend to be urban or rural, and face higher costs due to extremes of size and location. Extremely small rural and very large urban districts served many fewer students and spent far more per Chapter 1 participant than other districts. These results argue for the importance of economies of scale and cost factors: urban areas are more costly in terms of staff salaries, and the inefficiencies associated with serving very few drive up costs in small rural districts. High-poverty districts are faced with a trio of constraints: relatively larger numbers of educationally and economically needy children, fewer funds to supplement programs, and higher program costs. This situation is exacerbated where state and local funds are scarce, and costs are high.

Federal guidelines allow district choice in how many to serve and what types of programs to offer, but a lack of funds prevent poor districts from exercising this choice. The logical administrative step would be to limit the size and scope of the program, so as to have the program of greatest effect.

The lack of funds may be due in part to the federal formula. State per pupil expenditures are used as a measure of cost, which may be inaccurate, as previously discussed. Also, funds are allocated in direct proportion to poverty, rather than concentrating money in the poorest districts. The overall effect was discussed in the beginning section of this paper: the tendency for Chapter 1 to serve more non-poor than poor students, and the lack of service in some of the poorest schools.

To remedy this situation, poor districts must find other funds to add to Chapter 1 disbursements, or federal and state distribution requirements could be altered to concentrate funds on poor districts. Increasing allocations per child for poor districts, and/or adding a premium for districts above a certain poverty rate could assure more fair distributions.

Table 1: National Data—Regression Coefficients

Dependent Variable:	Ln (Participation Rate)					Ln (Participant-Poverty Ratio)					Ln (C1 $ per Participant)				
	R: .74					R: .80					R: .455				
	Adjusted R : .55					Adjusted R : .64					Adjusted R : .204				
	Standard Error: .464					Standard Error: .464					Standard Error: .464				
	F: 308					F: 451					F: 66				
	p: .0001					p: .0001					p: .0001				
Independent Variables:	b	B	T	p	pr	b	B	T	p	pr	b	B	T	p	pr
Ln (Poverty Rate)	0.712	0.933	37.71	0.0001	0.73	-0.281	-0.326	-14.73	0.0001	-0.38	0.281	0.483	14.73	0.0001	0.38
Ln (C1 $ per Low-Income Child)	0.590	0.616	25.02	0.0001	0.57	0.590	0.550	25.01	0.0001	0.57	0.410	0.566	17.37	0.0001	0.44
Ln (Number of Schools)	-0.046	-0.061	-3.23	0.001	-0.09	-0.046	-0.055	-3.24	0.001	-0.09	0.046	0.081	3.23	0.001	0.09
Ln (State CE$ per Enrolled)	0.023	0.060	3.00	0.001	0.08	0.023	0.053	2.99	0.001	0.08	-0.023	-0.079	-2.99	0.001	-0.08
Presence of Local CE$	-0.111	-0.052	-2.55	0.01	-0.07	-0.111	-0.046	-2.55	0.01	-0.07	0.111	0.068	2.55	0.01	0.07
Constant	-7.678					-3.075					3.075				

Table 2: Correlation Matrix—All districts (weighted)

	Pov	Enr	Sch	Sch	PPE	SPPE	STR	SCE$	C1$/En	C1$/LI	C1PR	C1PPR
Poverty												
Enrollment	-0.02											
Number of Schools	-0.01	0.93										
Total Per Pupil Expenditure	-0.08	-0.02	-0.01	-0.01								
Average PPE for State	-0.43	-0.05	-0.05	-0.05	0.39							
Student-Teacher Ratio	-0.03	0.32	0.10	0.10	-0.18	-0.07						
State CE Funds	0.06	0.01	0.00	0.00	0.13	0.27	-0.01					
C1 Expenditures per Enrolled	0.48	-0.01	0.02	0.02	0.61	-0.03	-0.14	0.06				
C1 Expenditures per LI child	-0.38	-0.03	-0.02	-0.02	0.34	0.45	-0.08	0.14	0.22			
C1 Participation Rate	0.43	-0.01	0.00	0.00	0.30	-0.12	-0.07	0.12	0.60	-0.03		
C1 Participant-Poverty Ratio	-0.38	-0.03	-0.04	-0.04	0.17	0.24	-0.02	0.15	-0.05	0.66	0.28	
C1 Expenditure per Participant	0.06	0.01	0.03	0.03	0.11	0.21	-0.05	-0.02	0.26	0.24	-0.21	-0.23

Table 3: National Data--District Characteristics

		By Poverty		By Enrollment		By Urban/Rural Status		
	All Districts	Low Poverty (7% or less)	High Poverty (20% or more)	Small (1501	Large)9,999	Urban	Rural	Suburb
Poverty	13%	3%a	32%b	12%	14%	14%a	14%a	9%b
Enrollment	2815	2079	3114	563 a	28074 b	28328 a	1404 b	3523 c
Number of Schools	6	4 a	6 b	2 a	42 b	47 a	4 b	6 c
Average School Size	396	383	395	285 a	923 b	587 a	335 b	503 a
Total Per Pupil Expenditure	$3,505	$3,763 a	$3,251 b	$3,719	$3,246	$3,498	$3,349 b	$3,571 b
Average State per Pupil Exp.	$3,526	$3,706 a	$3,054 b	$3,529 a	$3,353 b	$3,547	$3,423 a	$3,703 b
Student-Teacher Ratio	20	25 a	16 b	22 a	31 b	18	22	20
Likelihood of Local CE Program	13%	18%a	8%b	11%a	19%b	27%a	11%b	21%a
Likelihood of State CE Program	32%	30%a	41%b	29%a	57%b	63%a	30%b	46%c
State CE Funds	$17	$18	$18	$15	$22	$27 a	$12 b	$25 a
C1 Expenditures per Enrolled	$78	$63 a	$116 b	$87 a	$70 b	$98 a	$88 a	$52 b
C1 Expenditures per LI child	$702	$1,119 a	$375 b	$749 a	$584 b	$786 a	$570 b	$840 a
C1 Participation Rate	14%	12%a	19%b	15%a	11%b	15%a	13%a	11%b
C1 Participant-Poverty Ratio	1.27	2.11 a	0.62 b	1.33 a	0.95 b	1.18	1.01 a	1.55 b
C1 Expenditure per Participant	$657	$647	$680	$672	$688	$748 a	$670 a	$607 b
Likelihood of being urban	2%	1%a	2%b	0%a	32%b			
Likelihood of being rural	58%	47%a	71%b	70%a	14%b			
Likelihood of being suburban	40%	52%a	27%b	30%a	54%b			

	By C1 $ per Low-Income Student			By State Program		By Local Program	
	$400 or Less	$400 to $675	$675 or More	None	State Program	None	Local Program
				12%a	14%b	13%a	10%b
Poverty	24%a	10%b	7%c	2224 a	4047 b	2683	3706
Enrollment	3472 a	2173 b	3483 a	5 a	7 b	6	7
Number of Schools	7 a	5 b	7 a	365 a	460 b	378 a	515 b
Average School Size	461 a	350 b	424 a	$3,525	$3,464	$3,436 a	$4,050 b
Total Per Pupil Expenditure	$2,774 a	$3,611 b	$4,119 c	22 a	18 b	21	18
Average State per Pupil Exp.	$3,093 a	$3,532 b	$3,951 c	$3,414 a	$3,760 b	$3,436 a	$4,133 b
Student-Teacher Ratio	17 a	24 b	15 a	5%a	30%b		
Likelihood of Local CE Program	7%a	14%b	18%c			26%a	75%b
Likelihood of State CE Program	36%a	29%b	35%a	$0 a	$42 b	$14 a	$37 b
State CE Funds	$18 a	$10 b	$30 c	$79	$74	$80 a	$62 b
C1 Expenditures per Enrolled	$65 a	$83 b	$82 b	$684	$739	$661 a	$1,026 b
C1 Expenditures per LI child	$273 a	$531 b	$1,280 c	13%a	15%b	14%a	12%b
C1 Participation Rate	12%a	15%b	12%a	1.24	1.35	1.23 a	1.53 b
C1 Participant-Poverty Ratio	0.59 a	1.07 b	2.24 c	$677 a	$611 b	$656	$663
C1 Expenditure per Participant	$567 a	$640 b	$768 c	1%a	4%b	2%a	4%b
Likelihood of being urban	1%a	1%a	4%b	60%a	55%b	60%a	48%b
Likelihood of being rural	68%a	66%a	34%b	23%a	41%b	27%a	47%b
Likelihood of being suburban	21%a	26%a	45%b				

*Different subscripts denote significant differences.

Table 4: New York Regression Coefficients

Dependent Variable:	Ln (C1 Participation Rate)					Ln (C1 Participant-Poverty Ratio)					Ln (C1 $ per Participant)				
	R: .827					R: .608					R: .574				
	Adjusted R : .674					Adjusted R : .361					Adjusted R : .325				
	Standard Error: .376					Standard Error: .461					Standard Error: .359				
	F: 63.349					F: 43.657					F: 73.830				
	p: .0001					p: .0001					p: .0001				
Independent Variables:	b	B	T	p	pr	b	B	T	p	pr	b	B	T	p	pr
Ln (Poverty Rate)	0.566	0.779	12.42	0.0001	0.715	-0.256	-0.404	-5.701	0.0001	0.422	0.276	0.574	8.592	0.0001	0.573
Ln (C1 $ per Low-Income)	0.756	0.242	4.64	0.0001	0.357	0.880	0.322	4.546	0.0001	0.347					
Ln (Reading Ach)	-1.268	-0.163	-2.92	0.004	0.234										
Ln (Enrollment)	-0.148	-0.253	-3.95	0.0001	0.309										
Rural District Marker	-0.238	-0.178	-2.74	0.007	0.220										
Constant	1.073					-6.491					7.266				

Dependent Variable:	Ln (PSEN Participation Rate)					Ln(PSEN Participant-Poverty Ratio)					Ln (PSEN $ per Participant)				
	R: .654					R: .756					R: .684				
	Adjusted R : .417					Adjusted R : .566					Adjusted R : .457				
	Standard Error: .556					Standard Error: .548					Standard Error: .556				
	F: 36.958					F: 99.281					F: 43.307				
	p: .0001					p: .0001					p: .0001				
Independent Variables:	b	B	T	p	pr	b	B	T	p	pr	b	B	T	p	pr
Ln (Poverty Rate)						-0.927	-1.013	-13.95	0.0001	0.751					
Ln (PSEN $ per Low-Inc)	0.515	0.654	5.030	0.0001	0.380	0.520	0.579	7.975	0.0001	0.545	0.485	0.595	4.741	0.0001	0.362
Ln (Tax Base per Enr)	0.428	0.378	3.885	0.0002	0.303						-0.428	-0.365	-3.885	0.0002	0.303
Ln (State Aid per Enr)	0.513	0.264	1.979	0.05	0.160						-0.513	-0.255	-1.979	0.05	0.160
Constant	-10.65					-4.684					10.654				

Dependent Variable:	Ln (CE Participation Rate)					Ln (CE Participant-Poverty Ratio)					Ln (CE $ per Participant)				
	R: .767					R: .837					R: .693				
	Adjusted R : .578					Adjusted R : ..690					Adjusted R : .474				
	Standard Error: .371					Standard Error: .333					Standard Error: .330				
	F: 52.801					F: 68.244					F: 68.906				
	p: .0001					p: .0001					p: .0001				
Independent Variables:	b	B	T	p	pr	b	B	T	p	pr	b	B	T	p	pr
Ln (Poverty Rate)	0.292	0.465	5.834	0.0001	0.432	-0.666	-1.012	-14.14	0.0001	0.759	0.289	0.577	9.155	0.0001	0.600
Ln (C1 $ per Low-Income)	0.574	0.212	3.650	0.0004	0.287	0.482	0.170	3.352	0.001	0.266					
Ln (PSEN $ per Enrolled)	0.367	0.595	5.726	0.0001	0.425	0.242	0.375	5.979	0.0001	0.442					
Ln (Tax Base per Enr)	0.293	0.330	4.021	0.0001	0.313						-0.164	-0.232	-3.682	0.0003	0.288
Ln (Enrollment)						-0.078	-0.146	-2.987	0.005	0.239					
Ln (Reading Achievement)						-0.781	-0.110	-2.023	0.05	0.164					
Constant	-7.475					-1.128					8.001				

Table 5: New York Correlations

	Pov	Enr	TPPE	LR	TB	TR	SA	Ps$	Ach	C1$E	C1$LI	C1PR	C1PPR	C1$P	PsPR	Ps$P	TPR	TPPR
Enrollment	0.10																	
TPPE	-0.24	-0.01																
Local Revenue per Enr	-0.39	-0.02	0.92															
Tax Base per Enrolled	-0.14	-0.09	0.67	0.68														
Tax Rate per Enrolled	-0.39	0.15	0.39	0.39	-0.08													
State Aid per Enrolled	0.43	-0.04	-0.32	-0.65	-0.37	-0.19												
PSEN Aid per Enrolled	0.53	0.08	-0.40	-0.66	-0.35	-0.23	0.85											
Achievement	-0.38	-0.24	0.06	0.18	-0.07	0.06	-0.27	-0.50										
C1 $ per Enrolled	0.90	0.17	-0.04	-0.21	0.00	-0.33	0.35	0.43	-0.43									
C1 $ per LI child	-0.24	-0.05	0.22	0.19	0.17	0.15	-0.04	-0.13	0.10	-0.08								
C1 Participation Rate	0.71	0.03	-0.06	-0.19	0.00	-0.24	0.28	0.43	-0.47	-0.80	-0.01							
C1 Part-Poverty Ratio	-0.43	-0.09	0.23	0.28	0.10	0.27	-0.20	-0.26	0.21	-0.32	0.74	-0.01						
C1 $ per Participant	0.48	0.19	-0.02	-0.15	0.00	-0.17	0.31	0.21	-0.12	0.48	-0.10	-0.07	-0.55					
PSEN Part Rate	0.33	-0.01	-0.03	-0.20	0.00	-0.15	0.42	0.45	-0.34	0.41	0.01	0.55	-0.06	-0.01				
PSEN $ per Part	0.25	0.07	-0.33	-0.43	-0.29	-0.15	0.40	0.49	-0.50	0.16	-0.15	0.05	-0.25	0.21	-0.32			
Total CE Part Rate	0.60	0.01	-0.05	-0.22	0.00	-0.23	0.39	0.50	-0.46	0.71	0.00	0.90	-0.04	-0.04	0.86	-0.13		
Total CE Part-Pov Rati	-0.56	-0.11	0.18	0.22	0.07	0.27	-0.15	-0.24	0.24	-0.45	0.66	-0.19	0.80	-0.50	0.15	-0.38	-0.04	
Total CE $ per Part	0.55	0.18	-0.31	-0.45	-0.24	-0.23	0.47	0.48	-0.21	0.46	-0.18	0.04	-0.51	0.76	-0.23	0.72	-0.09	-0.61

Table 6: New York District Characteristics

	By Poverty			By Urbanicity			By Enrollment		
	All	Low-Poverty (8%	High-Poverty) 19%	Urban	Rural	Suburb	Very Small (1500	Medium	Very Large)10,000
Poverty	14%	3%a	25%b	18%a	16%a	8%b	16%a	11%b	22%a
Enrollment	2864	2467	3998	9965 a	1039 b	3163 c	778 a	3721 b	25174 c
TPPE	$6,128	$7,609 a	$6,067 b	$5,939 a	$5,750 a	$7,128 b	$6,115	$6,133	$6,286
Local Revenue per Enr	$3,165	$5,503 a	$2,460 b	$2,587 a	$2,627 a	$4,761 b	$3,049	$3,330	$2,839
Tax Base per Enrolled	$169	$274 a	$129 b	$107	$175	$190	$201	$136	$114
Tax Rate per Enrolled	1.86	2.27 a	1.7 b	2 a	1.58 b	2.45 c	1.66 a	2.09 b	2.03
State Aid per Enrolled	$2,751	$2,017 a	$3,264 b	$3,004 a	$2,918 a	$2,215 b	$2,857	$2,609	$2,937
PSEN Aid per Enrolled	$62	$23 a	$87 b	$78 a	$69 a	$36 b	$66	$54 a	$91 b
Ach (% passing PEP)	90%	95%a	88%b	86%a	90%b	92%b	91%a	90%a	81%b
C1 $ per Enrolled	$95	$30 a	$168 b	$133 a	$100 b	$62 c	$108 a	$73 b	$168 c
C1 $ per LI child	$548	$685 a	$500 b	$513	$546	$573	$553	$544	$523
C1 Participation Rate	11%	5%a	18%b	14%a	12%a	9%b	13%a	9%b	16%a
C1 Part-Poverty Ratio	0.82	1.48 a	0.55 b	0.58 a	0.75 a	1.1 b	0.81	0.85	0.53
C1 $ per Participant	$838	$567 a	$1,019 b	$1,007 a	$853 a	$708 b	$837	$816	$1,155
PSEN Part Rate	9%	7%a	12%b	11%	9%	8%	10%a	8%b	13%
PSEN $ per Part	$756	$439 a	$859 b	$859 a	$834 a	$516 b	$771	$731	$862
Total CE Part Rate	21%	12%a	29%b	25%a	21%a	17%b	23%a	17%b	29%a
Total CE Part-Pov Ratio	1.62	3.27 a	0.9 b	1.04 a	1.47 a	2.3 b	1.57	1.73	0.99
Total CE $ per Part	$772	$455 a	$943 b	$906 a	$816 a	$592 b	$782	$742	$999

Table 7: Vermont Regression Coefficients

Dependent Variable:	Ln (C1 Participation Rate)					Ln (C1 Participant-Poverty Ratio)					Ln (C1 $ per Participant)				
	R: .749					R: .276					No Independent Variables				
	Adjusted R : .546					Adjusted R : .060					met significance criteria.				
	Standard Error: .338					Standard Error: .330									
	F: 35.904					F: 4.717									
	p: .0001					p: .04									
Independent Variable	b	B	T	p	pr	b	B	T	p	pr	b	B	T	p	pr
Ln (Poverty Rate)	0.802	0.616	6.79	0.0001											
Ln (Enrollment)	-0.280	-0.312	-3.45	0.001		-0.168	-0.276	-2.172	0.03						
Constant	1.418					0.799									

Table 8: Vermont Correlations

	Pov	Enr	TPPE	LR	TB	TR	SA	C1$/LI	C1PR	C1PPR
Poverty										
Enrollment	-0.21									
Total Per Pupil Expenditure	-0.30	-0.30								
Local Revenue per Enrolled	-0.43	-0.19	-0.19							
Tax Base per Enrolled	-0.40	0.60	0.60	0.43						
Tax Rate per Enrolled	0.04	0.09	0.09	-0.10	-0.39					
State Aid per Enrolled	0.43	-0.10	-0.10	-0.64	-0.62	0.16				
C1 Appropriations per LI child	-0.23	-0.11	-0.11	0.52	-0.01	0.11	-0.28			
C1 Participation Rate	0.55	-0.38	-0.38	-0.10	-0.37	-0.10	0.24	0.02		
C1 Participant-Poverty Ratio	-0.07	-0.22	-0.22	0.05	-0.16	-0.16	-0.06	0.25	0.68	
C1 Expenditure per Participant	-0.04	0.10	0.10	0.13	0.11	0.21	-0.02	0.11	-0.62	-0.85

Table 9: Vermont District Characteristics

		By Poverty		By Enrollment	
	All	Low-Poverty (8%	High-Poverty)19%	Very Small (1501	Other)1500
Poverty	13%	4%a	22%b	14%	20%
Enrollment	1572	1677	1568	993 a	2308 b
Total Per Pupil Expenditure	$4,099	$5,396 a	$3,845 b	$4,407 a	$3,709
Local Revenue per Enrolled	$2,862	$4,133 a	$1,974 b	$3,142	$2,506
Tax Base per Enrolled	$2,642	$2,648	$1,432	$3,105 a	$2,054 b
Tax Rate per Enrolled	1.19	1.53	1.38	1.14	1.25
State Aid per Enrolled	$1,238	$1,263	$1,871	$1,265	$1,203
C1 Appropriations per LI child	$517	$518	$498	$522	$511
C1 Participation Rate	12%	5%a	15%b	13%a	10%b
C1 Participant-Poverty Ratio	0.70	0.60	0.57	0.74	0.66
C1 Expenditure per Participant	$816	$1,008	$901	$808	$828

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Endnotes

1. This database and its codebook are available through Decision Resources Corporation, Washington, DC. The codebook describes the weighting system, designed to account for oversampling of certain types of districts. To assure accurate significance levels, I divided each weight by 2145, to bring the weighted total number of cases back down to 2145.

2. The Orshansky measure calculates poverty according to family size, cost of living related to place of residence, and whether the family lives on a farm.

3. SMSAs are defined by the Office of Management and Budget as the area around central cities or urbanized areas of 50,000 people or more. The urban population includes all persons living in urbanized areas and in places of 2500 or more inhabitants outside these areas. All others are rural.

4. Data on allocations and carryover funds were available for 1985-86, but not 1984-85. The correlation between allocations and total Chapter 1 budgets for 1985-86 was .969.

END

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